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A6M  
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(54) Exercise equipment

(57) Exercise equipment which can be assembled to form a plurality of different physical fitness exercisers comprises metal bars (1), H-shaped hand protective pieces (6), weight plates (2), hand grips (3), rubber belts (45), an elastic rope (4), a metal tube (85), supporting stands (7), auxiliary equipment (9), a joint (8), hand protective pieces (6), bolts (55), metal stoppers (66), and end caps (5). At least 2 of the bars (1) have hollow ends with male and female threads disposed at the outer and inner surfaces thereof; some of the weight plates (2) cooperate with the male threads on the bars (1). With these elements one can build up the exercisers of a dumbbell set, a figure trimming bar, a barbell, a door exerciser set, a weight skip rope, a figure trimming skip rope, a chestpull exerciser, a rhythmic hand grip or indoor horizontal bar.

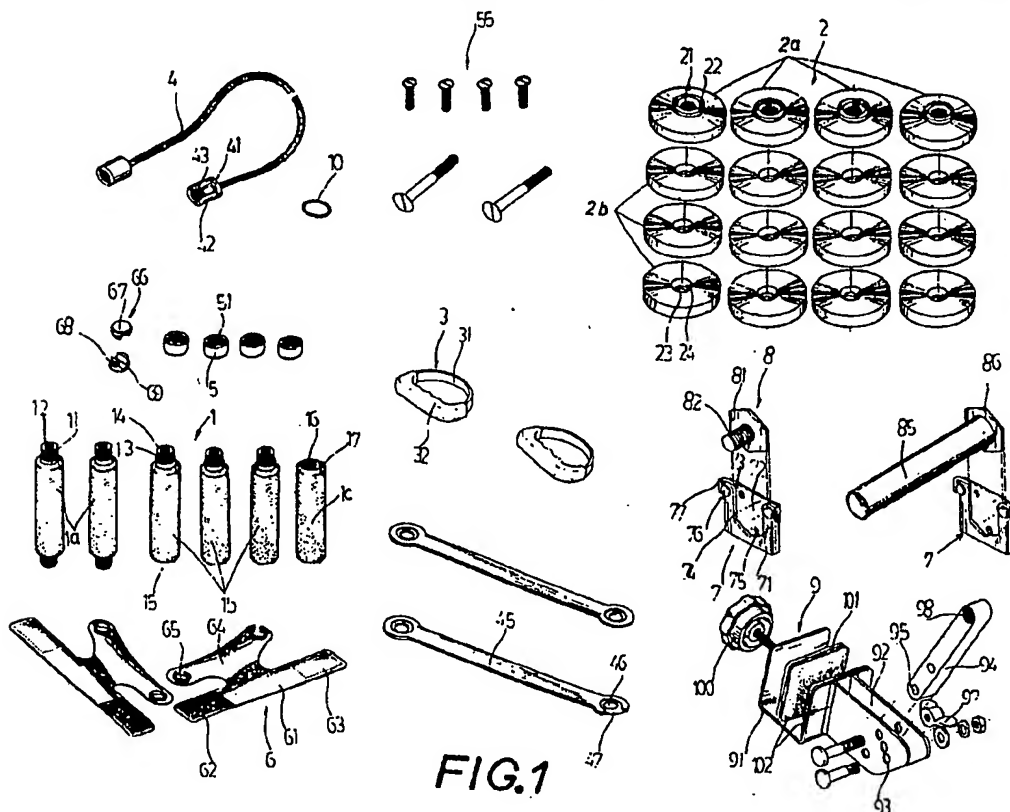


FIG.1

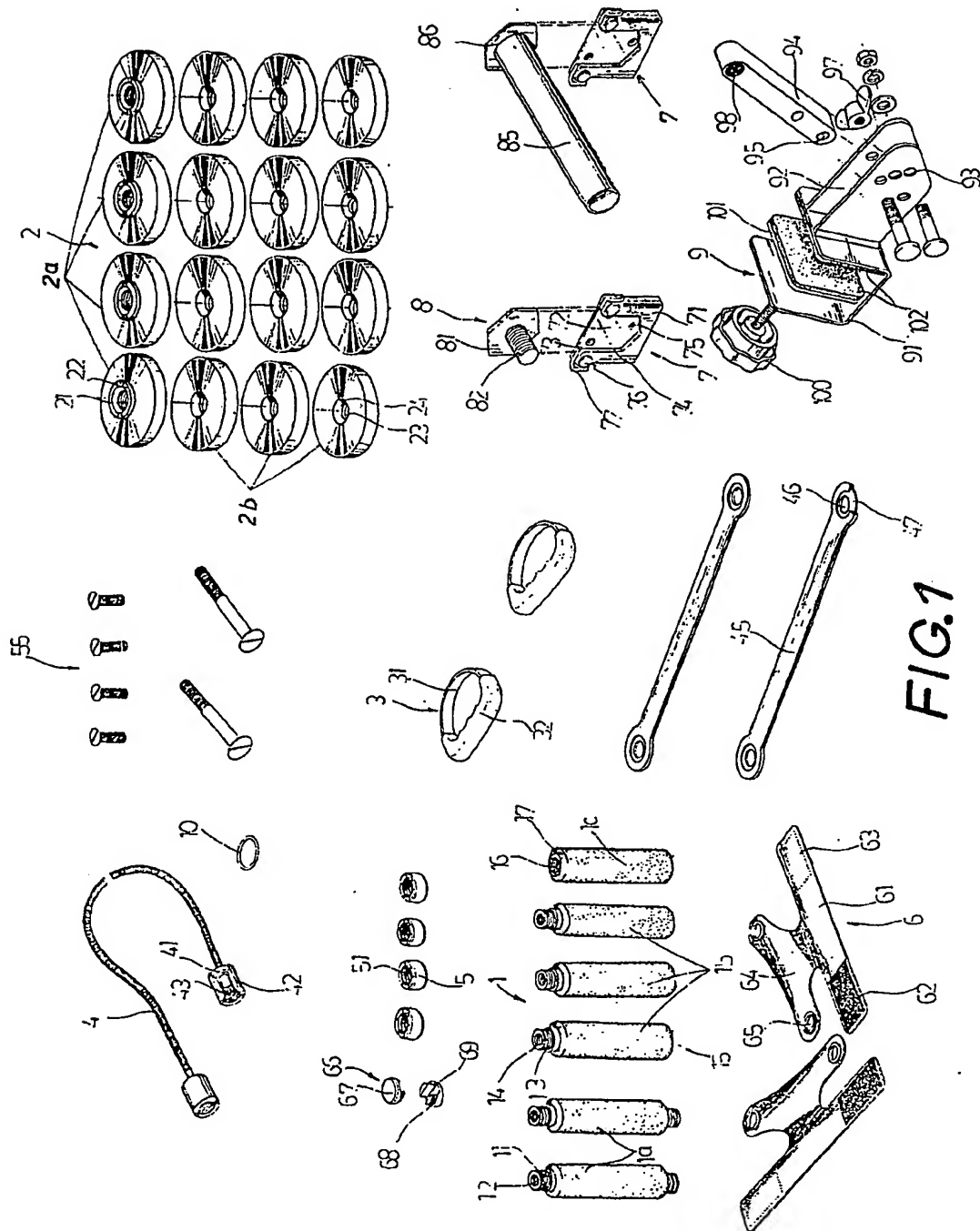
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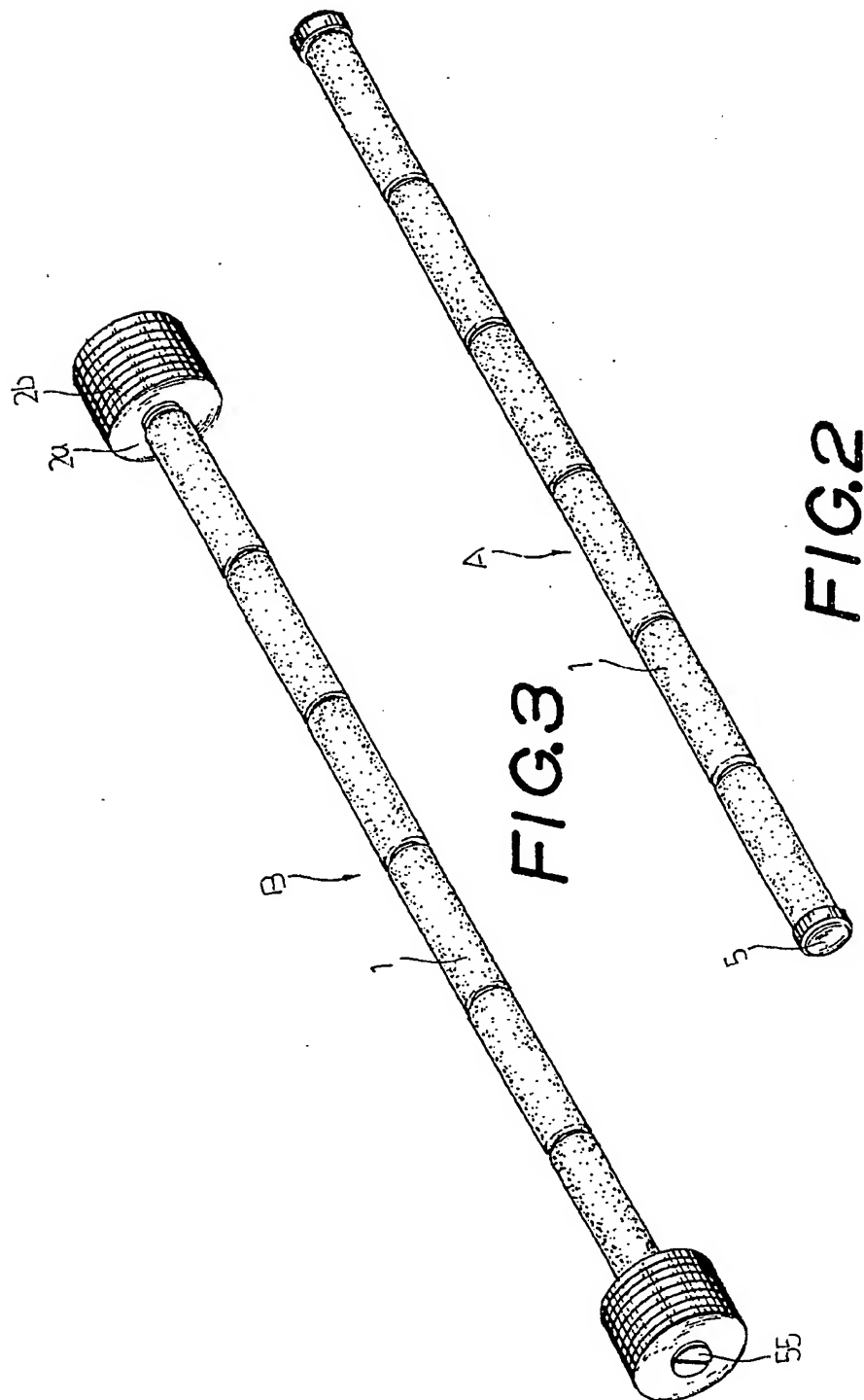
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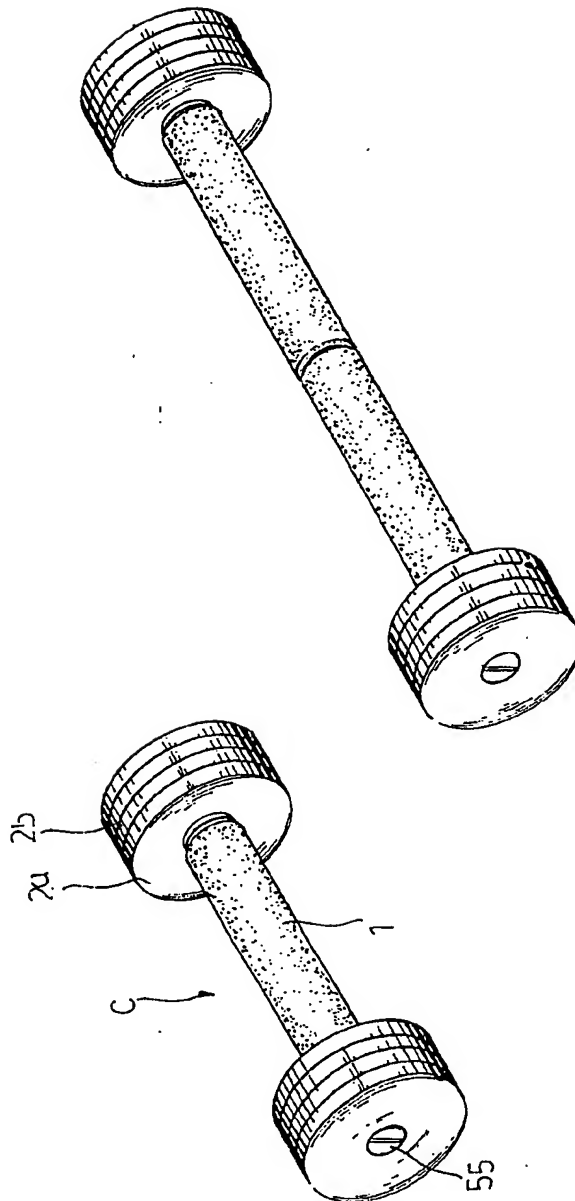


FIG. 4

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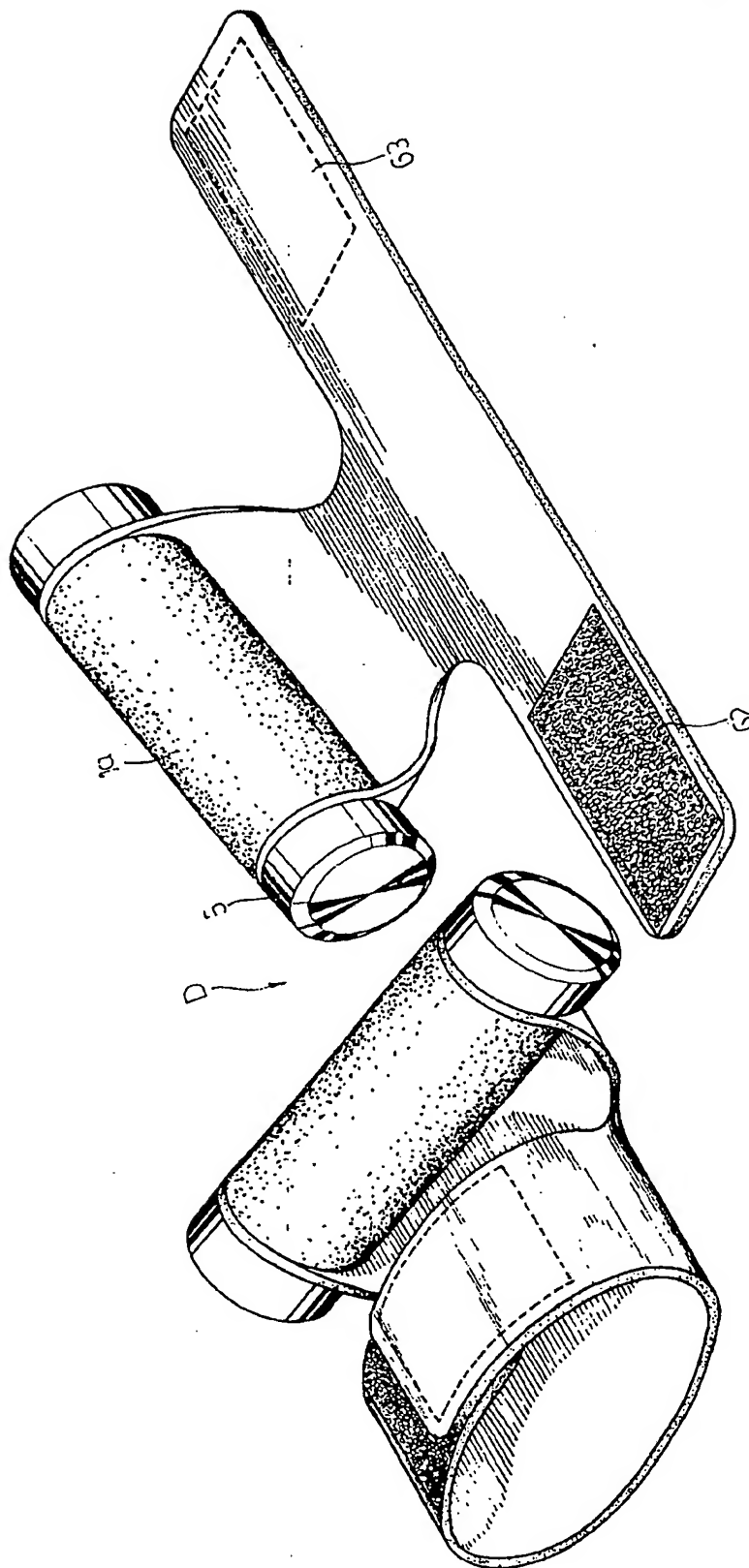


FIG. 5

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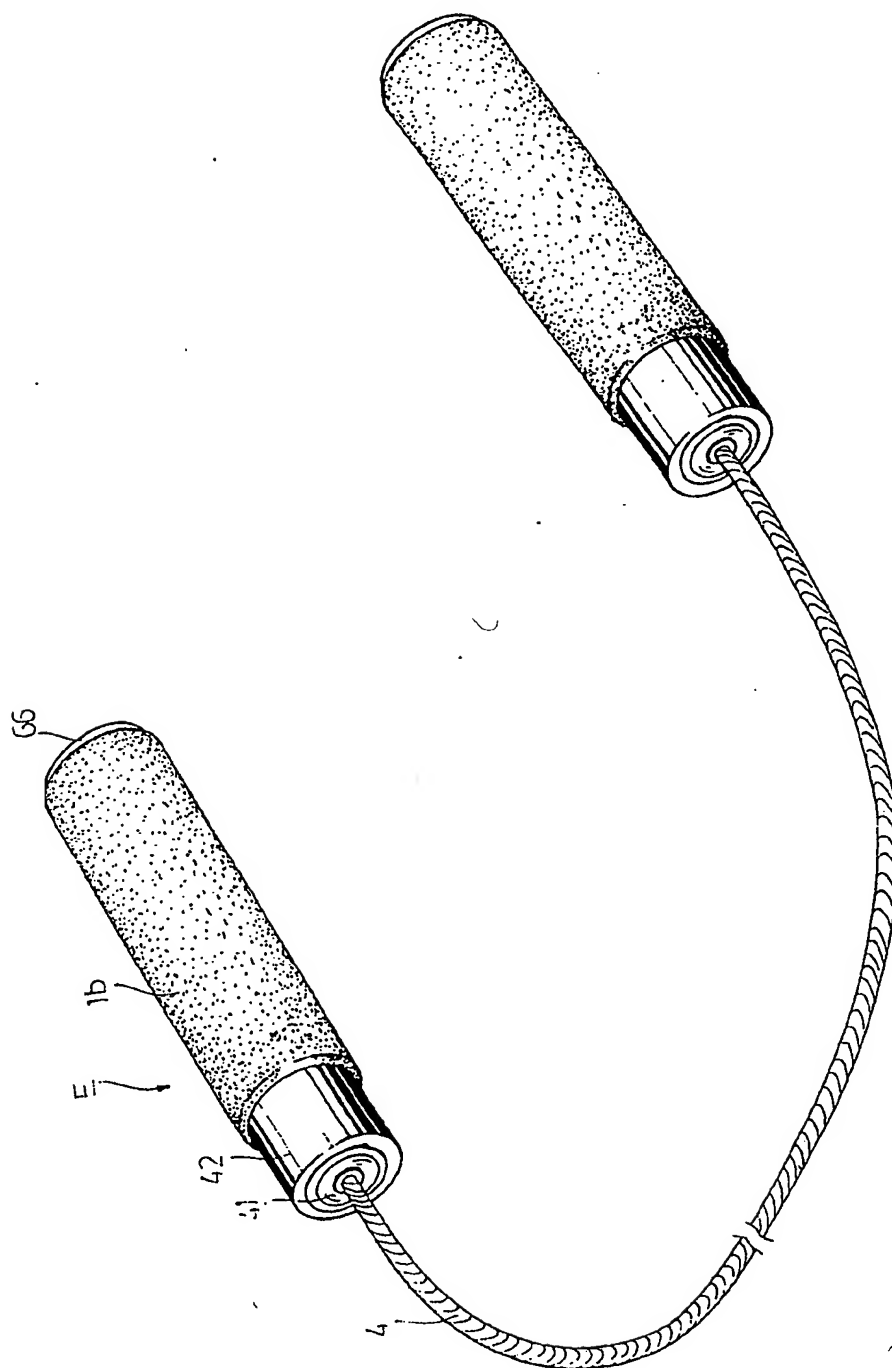


FIG. 6

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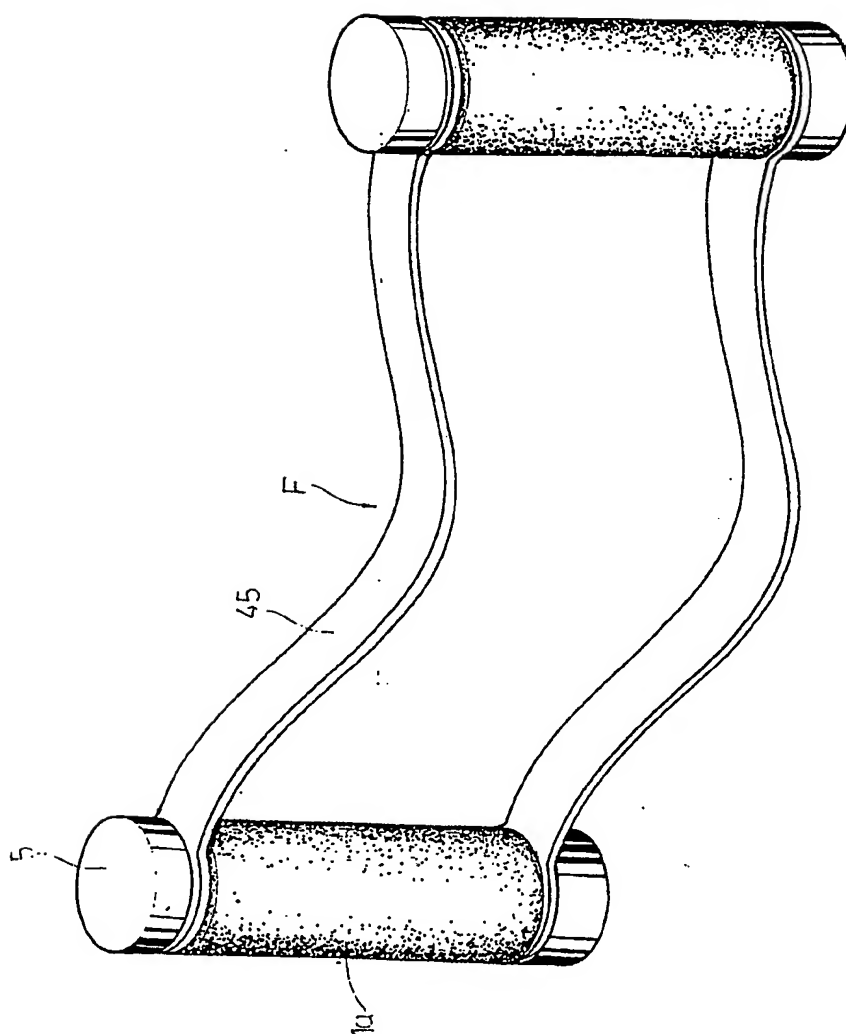


FIG. 7

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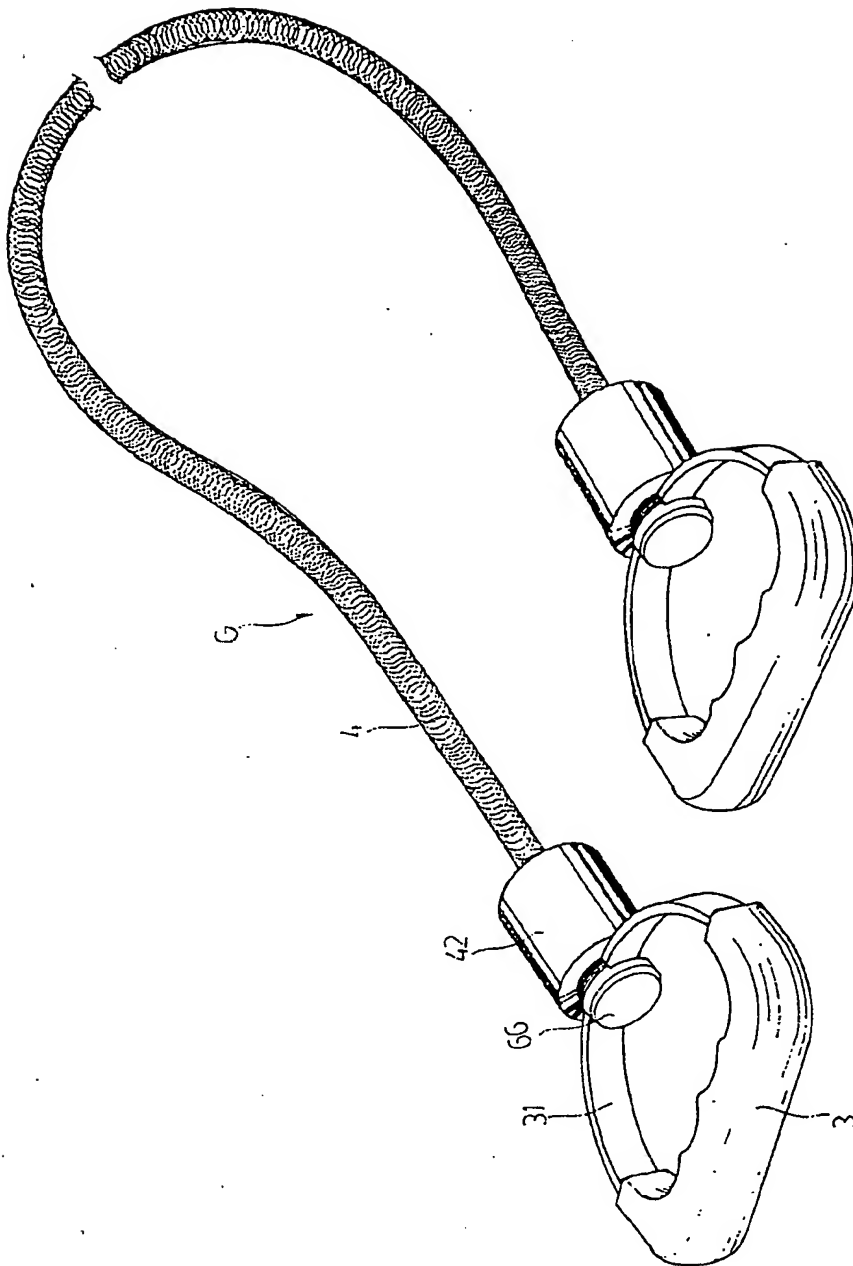
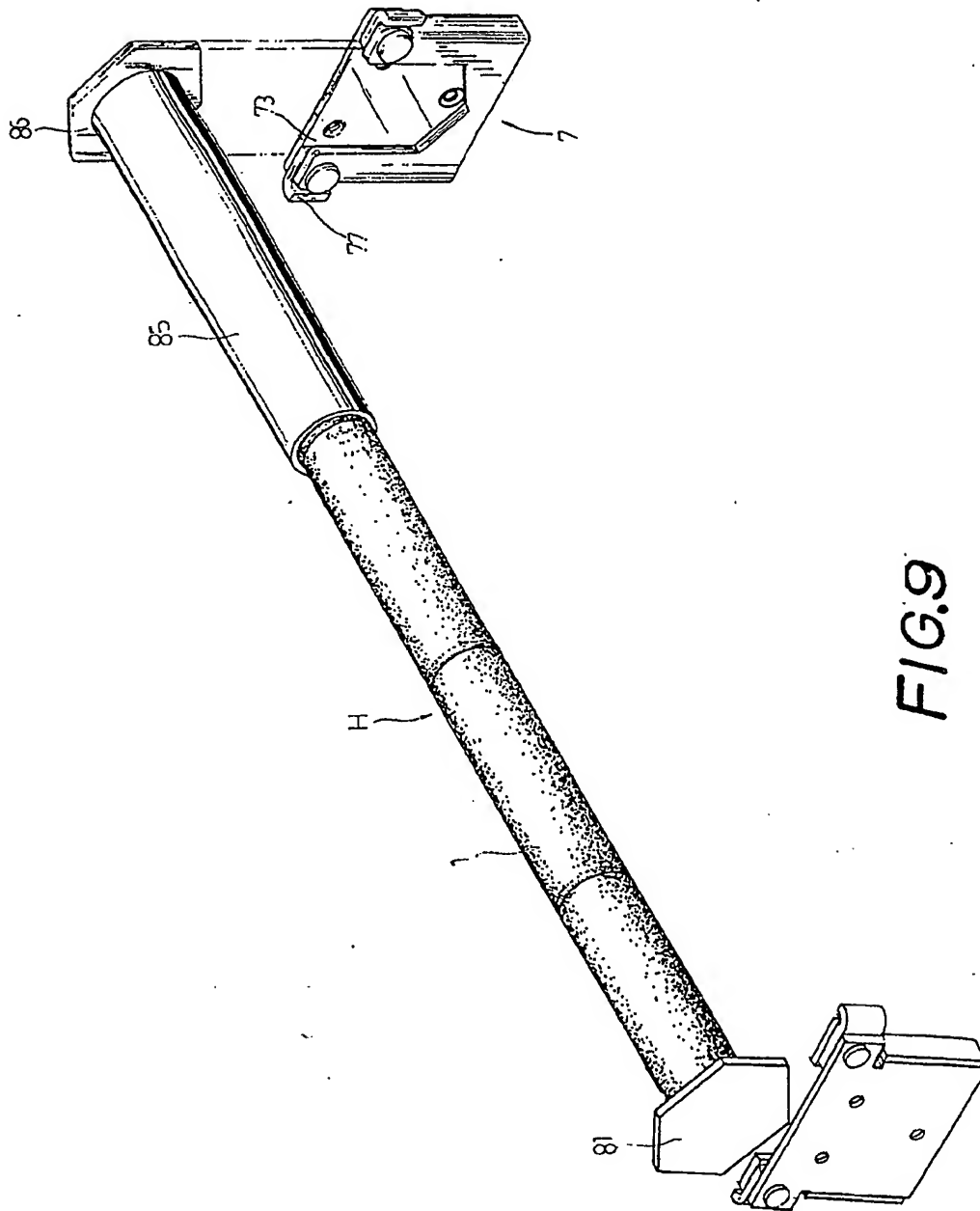


FIG. 8



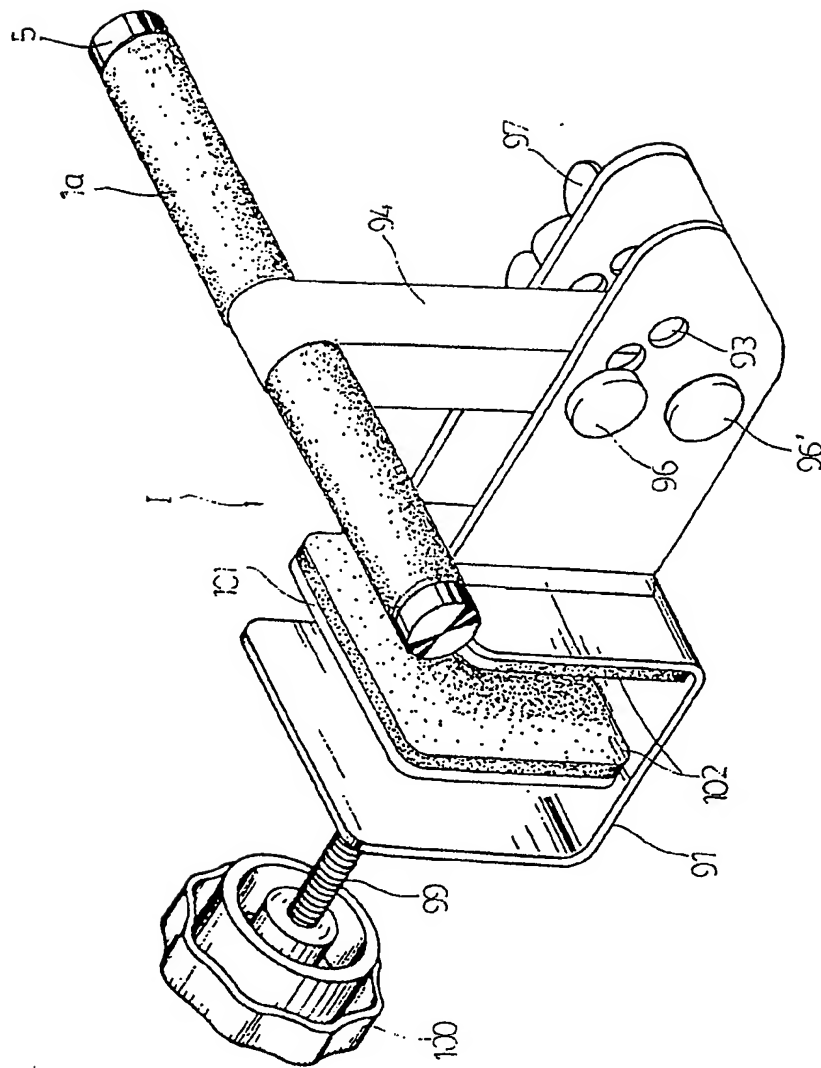
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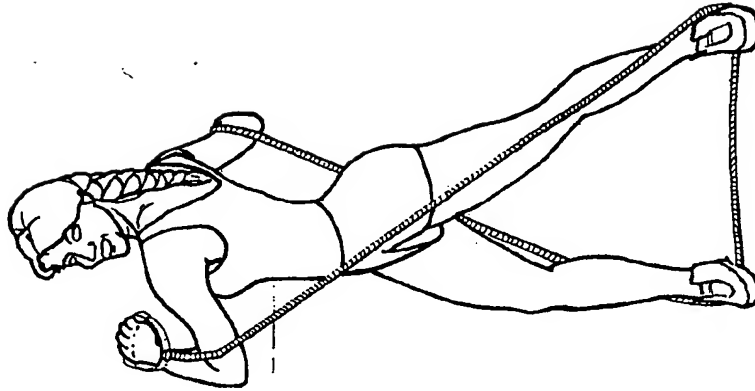


FIG. 12

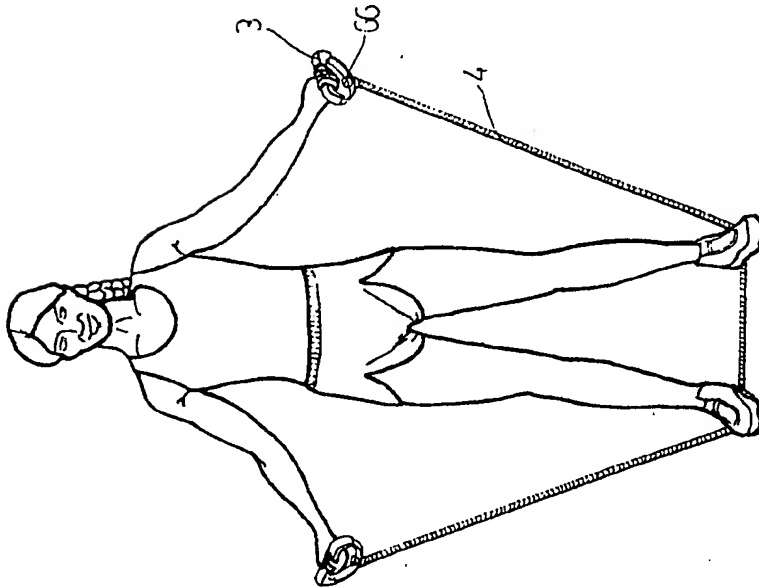


FIG. 11

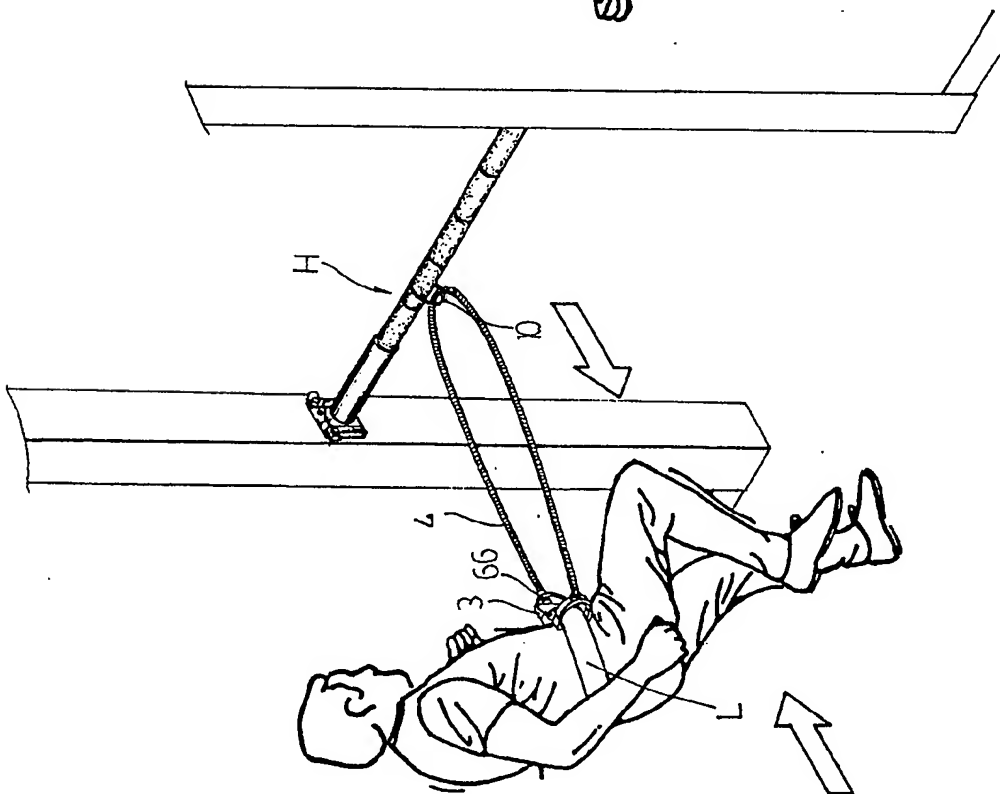


FIG. 13

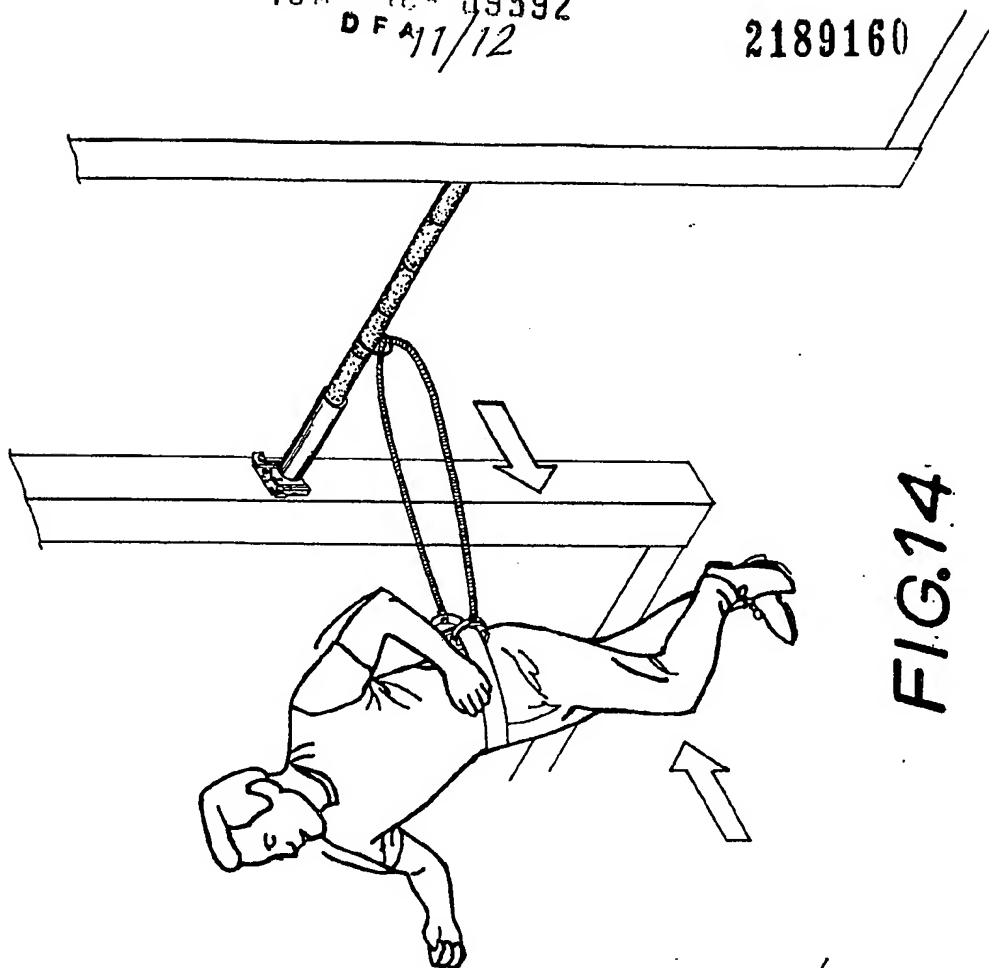


FIG. 14

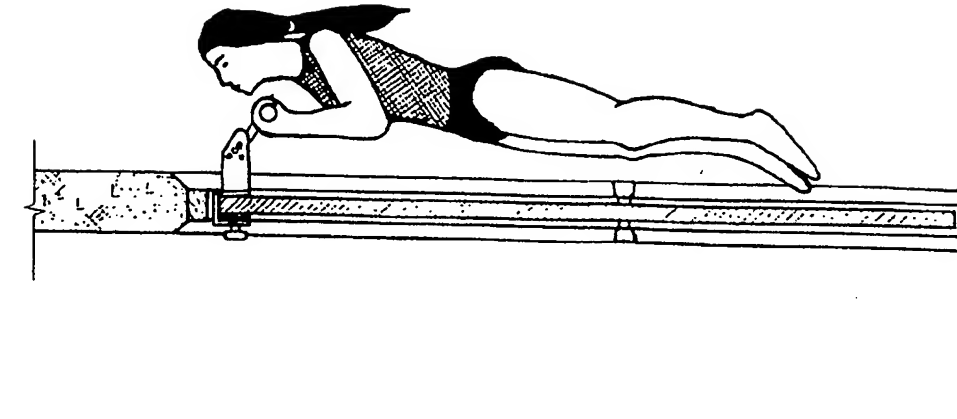
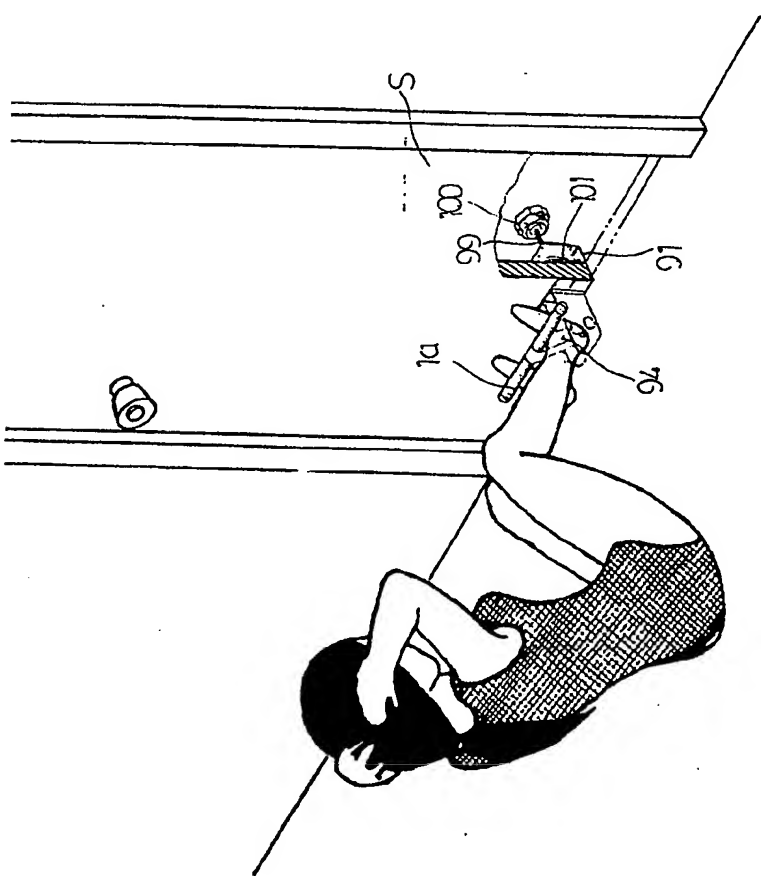


FIG. 16



## SPECIFICATION

### Exercise equipment

5 This invention relates to exercise equipment by means of which a plurality of physical fitness exercisers can be assembled.

Most kinds of general physical fitness exercisers, such as dumbbells, barbells, chest pulls and skip ropes, have a specific shape and construction according to their unique function and purpose of use. For instance, a dumbbell set is constructed of two bells connected by a short bar; a barbell is composed of weight plates disposed at both ends of a longer bar; a chest pull includes two handles connected by pull springs, a skip rope is a piece of rope with handles at both ends.

Owing to the different shape and purpose of use, each of the above-mentioned physical fitness exercisers can only be used independently. When a user wants to do various gymnastics, he must purchase a whole range of physical fitness exercisers which incurs great expense. Moreover, the different exercisers are not convenient to carry and they take up a lot of storage space.

The present invention aims to provide exercise equipment which is capable of overcoming these difficulties.

According to the invention, there is provided exercise equipment which can be assembled to form a plurality of different physical fitness exercisers, said equipment comprising at least two metal bars of which each end is hollow and has male and female threads disposed at its outer and inner surfaces respectively; a set of weight plates which are categorized into two types: one type having a screw hole at the centre, a tapered surface at one end of the screw hole and a flange around the other end of the screw hole and the other type having only a central hole with a tapered surface at one end of the central hole, said weight plates being engageable with the metal bars and adapted to be releasably fixed thereto; and two generally H-shaped hand protective pieces each comprising two strap portions, wherein one strap portion has a floss adhesive part at one end and a bristle adhesive part at the reverse side of the other end, forming a quick-release fastener, while the other strap portion has opening holes at both ends by means of which the hand protective pieces can be fitted on the metal bars, the hand protective pieces being able to cover a user's hands and to be quickly fastened on them. Thus, the exercise equipment according to the present invention can provide a weight-adjustable aerobic hand exerciser or a dumbbell.

The exercise equipment according to the present invention may further include two rubber belts and four end covers, each rubber belt having opening holes at both ends and

the end caps being equipped with internal screw threads which are engageable with the male threads on the ends of the metal bars, the two rubber belts being adapted to be connected to the metal bars such that the belts extend parallel to each other and the bars extend parallel to each other, the belts being secured to the bars by the end caps on the ends of the metal bars so that the equipment can be used as a chest pull exerciser. Preferably, the holes in the ends of the rubber belts are reinforced by metal washers.

The exercise equipment according to the invention may also include four further metal bars, wherein one metal bar is provided with female threads at both ends and the other three metal bars are provided with female threads at one end and with male and female threads at the other end, the six metal bars being capable of being coupled together end to end to form a long bar. End caps may be used to cover the two ends of the long bar. A figure trimming bar exerciser is thus formed. By replacing the end caps with weight plates, a barbell exerciser can be quickly assembled.

The exercise equipment may further include a metal tube, a joint and two supporting stands, both the metal tube and the joint having a connection portion in the shape of a polygon at one end. The joint has also a bolt extension which is engageable with the long bar formed from the metal bars and the metal tube can accommodate the long bar. The supporting stands are adapted to be installed and fixed on the walls beside a door entrance and are designed to accommodate the connecting portions of the joint and metal tube to form an indoor horizontal bar exerciser.

The exercise equipment according to the present invention may further include an elastic rope, the two ends of the elastic rope being set on bearings disposed in small sleeves which have female threads on the inner surfaces; the sleeves, joined with the elastic rope and bearings, being adapted to be coupled with the male threads of said metal bars to form a weight skip rope. End caps may cover the ends of the metal bars.

The exercise equipment may further include D-shaped hand grips and two metal stoppers, wherein the two D-shaped hand grips are integrally composed of arc-shape metal portions and plastic grip portions of which each is formed as a wave shape on its inner surface and each metal stopper has an end surface and root portions, provided with male threads, which are separated by a channel for accommodating the metal portion of a respective hand grip, the male threads being engageable with the female threads of the sleeves of the elastic rope so that the hand grips can be joined to the elastic rope and fastened by the metal stoppers. Thus, a figure trimming skip rope can be assembled.

The exercise equipment according to the present invention may further include an auxiliary equipment which comprises a regulating screw, a U-shaped holder, a clamp plate, two parallel flat plates, an upright bar, bolts, washers and wing nuts, wherein the U-shaped holder is adapted to fit under or over the bottom or top edges of a door, the regulating screw is arranged to move the clamp plate into or out of engagement with the door to fasten or loosen the U-shaped holder on the door, the flat plates extend from the front side of the U-shaped holder and are provided with holes for receiving the bolts for securing the upright bar to the holder, and the upright member is provided with a screw-threaded hole for accommodating and engaging with the said metal bars. By means of this auxiliary equipment, the metal bars can be installed on the bottom or top edge of a door and can serve as an exercise for body raising.

The invention will now be further described, by way of example, with reference to the drawings, in which:—

*Figure 1* is an exploded perspective view showing elements of a preferred embodiment of an exercise equipment according to the invention;

*Figures 2 to 10* are perspective views showing examples of physical fitness exercisers which can be assembled from the elements of the exercise equipment shown in *Fig. 1*;

*Figures 11 to 14* show examples of uses of a figure trimming skip rope assembled from the exercise equipment shown in *Fig. 1*; and

*Figures 15 and 16* show an exerciser assembled from the equipment according to the invention fitted, respectively, to the bottom and top edges of a door.

Reference will first be made to *Fig. 1* of the drawings in which a preferred embodiment of the present invention is composed of six metal bars 1, a set of weight plates 2, two D-shaped hand grips 3, an elastic rope 4, two metal stoppers 66, two rubber belts 45, two hand protective pieces 6, two supporting stands 7, a joint 8, a metal tube 85, an auxiliary equipment 9, a ring 10, short and long bolts 55, and four end caps 5. Two of the metal bars 1a have male and female threads 11, 12 at the outer and inner surfaces of both ends. Three further metal bars 1b have female threads 15 at one end, and both male and female threads 13, 14 at the other end. The remaining metal bar 1c has female threads 16 at both ends. All six metal bars can be joined together to form a long bar and each metal bar is provided with a soft and resilient cover 17.

The weight plates 2 are categorized into two types 2a, 2b; one type 2a having a screw hole 21 at its centre, a tapered surface at one end of the screw hole and a flange 22 around the other end of the screw hole, while

the other type 2b has only a central hole 23 with a taper surface 24 at one end of the central hole 23.

The two D-shaped hand grips 3 are integrally composed of a metal portion 31 and a plastics grip portion 32 which is formed as a wave shape in its inner surface to provide recesses for receiving the fingers of a user.

The two ends of the elastic rope 4 are set on bearings 41 disposed in small sleeves 42 which have female threads 43 on their inner surfaces. The female threads 43 are of the same diameter as the male threads 11, 13 of the metal bars 1a, 1b to co-operate therewith.

The metal stoppers 66 have end surfaces 67 and male threads 68 at their root portions which are separated by a channel 69 for accommodating the strip-shape metal portion 31 of a respective hand grip 3, as shown in *Fig. 8*. The male threads 68 are designed to co-operate with the female threads 43 of the sleeves 42 of the elastic rope 4, and also with the female threads 14, 16 respectively of the metal bars 1b, 1c.

Each of the rubber belts 45 has opening holes 46 at both ends, which are reinforced by metal washers 47. The washers are of a size which is a little larger than the diameter of the male threads 11 of the metal bars 1a so that the rubber belts 45 can be hung on the metal bars 1a as shown in *Fig. 7*.

The hand protective pieces 6 are generally H-shaped comprising two strap portions 64, 61. Each strap portion 61 has a floss adhesive part 62 at one end and a bristle adhesive part 63 at the reverse side of the other end, forming a quick-release fastener with the floss adhesive part 62 and the bristle adhesive part 63. Each strap portion 64 has opening holes 65 at both ends, which are reinforced by metal washers, by means of which the hand protective pieces 6 can be hung on the metal bars 1a as shown in *Fig. 5*. Further, by the design of the strap portions 61, the hand protective pieces are able to cover a user's hands and be quickly fastened on them.

Both the joint 8 and the metal tube 85 have a connecting portion 81, 86 respectively in the shape of a polygon at one end. The joint 8 has also a bolt extension 82 which can be engaged with one of the metal bars 1a, 1b, 1c which can be interconnected end to end to form a long bar as shown in *Fig. 9*. The metal tube 85 can accommodate the assembled long bar.

The supporting stands 7 comprise a front plate 71, a rear plate 72, two L-shaped stoppers 77 and rivets 76. Between the front plate 71 and the rear plate 72, a groove space 73 is formed therein. The front plate 71 has an upwardly facing opening. With the groove spaces 73, the supporting stands 7 can accommodate the connecting portions 81, 86 of the joint 8 and metal tube 85 respectively. The L-shaped stoppers 77 are engaged

between the front plate 71 and rear plate 72 at the upper corners by rivets 76 and serve to limit the inserted connecting portions 81, 86.

- 5 The auxiliary equipment 9 comprises a regulating screw 100, a U-shaped holder 91, a clamp plate 101, two parallel flat plates 92, an upright bar 94, bolts, washers and wing nuts 97. The U-shaped holder 91 is adapted to fit under or over the bottom edge or top edge of a door as shown in Figs. 15 and 16 respectively. The regulating screw 100 is used to move the clamp plate 101 into or out of engagement with a door when the holder 91 is being fitted to or removed from the door. Rubber members 102 are disposed on the surface of the holder 91 and the surface of the clamp plate 101 which are designed to clamp between them a door in order to protect the surfaces of the door. The flat plates 92 extend from the front side of the U-shaped holder 91. Several sets of aligned holes 93 are provided on the flat plates 92. Two holes 95 on the upright bar 94 corresponding to the holes 93 are also provided. The bolts, washers and wing nuts 97 are used to connect the upright bar 94 to the flat plates 92, the bar being capable of being mounted in any one of three positions as desired by a user. A screw hole 98 is provided on the upright bar 94 for accommodating and engaging with the metal bars 1a, 1b as shown in Figs. 10, 15 and 16.

The ring 10 is provided to be clamped between two neighbouring metal bars when users want to do some special exercises as shown in Figs. 13 and 14. The short and long bolts 55 are used to join the weight plates 2 on the metal bars 1a, 1b as shown in Figs. 3 and 4. The end caps 5 with inner threads 51 are provided to cover the ends of the metal bars 1a, 1b.

Examples of physical fitness exercisers which can be built up by the above elements according to the invention are further described below.

#### 45 Figure Trimming Bar (A):

As shown in Fig. 2, by engaging together all the metal bars 1, and using the end caps 5 to cover the ends of the long bar formed from the metal bars, one can build up a figure trimming bar.

#### Barbell (B):

As shown in Fig. 3, replacing the end caps 5 with the weight plates 2, after fixing with bolts 55, one can set up a barbell exerciser. Dumbbell (C):

As shown in Fig. 4, using just one or two metal bars 1, instead of the long bar of the mentioned barbell exerciser, one can build up a dumbbell exerciser.

#### 60 Rhythmic Hand Grip (D) and Aerobic Hand Exercisers:

As shown in Fig. 5, joining the hand protective pieces on the metal bars 1a, 1b, using end caps 5 or metal stoppers 66 to cover the

ends, one can set up a rhythmic hand grip exerciser. The H-shape hand protective pieces are able to cover a user's hands and can be quickly fastened on them. Replacing the end caps 5 or metal stoppers 66 with weight plates 2 and using bolts 55 to fix them, one can obtain an aerobic hand exerciser.

#### Weight Skip Rope (E):

As shown in Fig. 6, joining the metal bars 1a, 1b on the two sleeves 42 at two ends of the elastic rope and adding the end caps 5 or metal stoppers 66, one can build a weight skip rope.

#### Chest Pull (F):

As shown in Fig. 7, by parallelly hanging two rubber belts 45 on two parallel metal bars 1a and adding the end caps 5, a chest pull is thus built up.

#### Figure Trimming Skip Rope (G):

As shown in Fig. 8, by joining the two D-shaped hand grips 3 with the sleeves 42 at the ends of the elastic rope 4 by the metal stoppers 66, a figure trimming skip rope can be built up. Examples of exercising are shown in Figs. 11 to 14.

#### Indoor Horizontal Bar (H):

As shown in Fig. 9, first, fixing the supporting stands on the walls beside a door entrance; next, joining the metal bars 1 together and engaging with the joint 8; further, using the metal tube 85 to accommodate the end of the jointed long bar; then, regulating the remaining length of the long bar beyond the accommodating of the metal tube 85 according to the distance between the two fixed supporting stands; and, finally, inserting the connecting portions 81, 86 into the groove spaces 73 of the supporting stands; one can easily set up an indoor horizontal bar for exercising in one's room.

#### Upper Door Exerciser (I):

As shown in Fig. 16, by clamping the auxiliary equipment 9 on the top edge of a door member, joining the metal bars 1a, 1b on the upright bar 94 and adding the end caps 5 or the metal stoppers 66 on the outside ends of the metal bars 1a, 1b, an upper door exerciser can be built up for body raising exercisers.

#### 115 Lower Door Exerciser (J):

As shown in Fig. 15, clamping the auxiliary equipment 9 on the bottom edge of a door member instead, one can obtain a lower door exerciser for body raising and lying exercises. Further, the height of the metal bars 1a, 1b can be regulated according to various sizes of users' feet, by fixing the upright bar 94 on the auxiliary equipment 9 in any one of the said three alternative positions.

To sum up, with the compact elements provided by the equipment of the present invention, many kinds of physical fitness exercisers can be constructed. This not only allows users to save money on exercise equipment, but also allows them to carry the equipment easily



and takes up little storage space.

# CLAIMS

1. Exercise equipment which can be assembled to form a plurality of different physical fitness exercisers, said equipment comprising at least two metal bars of which each end is hollow and has male and female threads disposed at its outer and inner surfaces respectively; a set of weight plates which are categorized into two types; one type having a screw hole at the centre, a tapered surface at one end of the screw hole and flange around the other end of the screw hole and the other type having only a central hole with a tapered surface at one end of the central hole, said weight plates being engageable with the metal bars and adapted to be releasably fixed thereto; and two generally H-shaped hand protective pieces each comprising two strap portions, wherein one strap portion has a floss adhesive part at one end and a bristle adhesive part at the reverse side of the other end, forming a quick-release fastener, while the other strap portion has opening holes at both ends by means of which the hand protective pieces can be fitted on the metal bars, the hand protective pieces being able to cover a user's hands and to be quickly fastened on them.

2. Exercise equipment according to claim 1 and further including two rubber belts and four end covers, wherein each rubber belt has opening holes at both ends and the end caps are equipped with internal screw threads which are engageable with the male threads on the ends of the metal bars, the two rubber belts being adapted to be connected to the metal bars such that the belts extend parallel to each other and the bars extend parallel to each other, the belts being secured to the bars by the end caps on the ends of the metal bars.

3. Exercise equipment according to claim 2, wherein the holes in the ends of the rubber belts are reinforced by metal washers.

4. Exercise equipment according to any preceding claim and including four further metal bars, wherein one metal bar is provided with female threads at both ends and the other three metal bars are provided with female threads at one end and with male and female threads at the other end, the six metal bars being capable of being coupled together end to end to form a long bar.

5. Exercise equipment according to claim 4 and further including a metal tube, a joint and two supporting stands, wherein both the metal tube and the joint have a connecting portion in the shape of a polygon at one end; the joint has also a bolt extension which is engageable with a long bar formed from said metal bars; the metal tube can accommodate the long bar, and the supporting stands are adapted to be installed and fixed on the oppo-

site walls beside a door entrance and are designed to accommodate the connecting portions of the joint and metal tube.

6. Exercise equipment according to any preceding claim and further including an elastic rope, wherein the two ends of the elastic rope are set on bearings disposed in small sleeves which have female threads on the inner surfaces; the sleeves, joined with the elastic rope and bearings, being adapted to be coupled with the male threads of said metal bars at one end.

7. Exercise equipment according to claim 6 and further including two D-shaped hand grips and two metal stoppers, wherein the two D-shaped hand grips are integrally composed of arc-shaped metal portions and plastic grip portions of which each is formed as a wave shape on its inner surface and each metal stopper has an end surface and root portions, provided with male threads, which are separated by a channel for accommodating the metal portion of a respective hand grip, the male threads being engageable with the female threads of the sleeves of the elastic rope so that the hand grips can be joined to the elastic rope and fastened by the metal stoppers.

8. Exercise equipment according to any preceding claim and further including an auxiliary equipment which comprises a regulating screw, a U-shaped holder, a clamp plate, two parallel flat plates, an upright bar, bolts, washers and wing nuts, wherein the U-shaped holder is adapted to fit under or over the bottom or top edges of a door, the regulating screw is arranged to move the clamp plate into or out of engagement with the door to fasten or loosen the U-shaped holder on the door, the flat plates extend from the front side of the U-shaped holder and are provided with holes for receiving the bolts for securing the upright bar to the holder, and the upright member is provided with a screw-threaded hole for accommodating and engaging with the said metal bars.

9. Exercise equipment according to claim 8, wherein the U-shaped holder and clamp plate are provided with rubber members arranged to engage the surfaces of a door, when the holder is fitted and clamped thereto, in order to protect the surfaces of the door.

10. Exercise equipment according to claim 8 or claim 9, wherein a series of holes are provided in the parallel plates to enable the upright bar to be secured to the U-shaped holder in at least two alternative positions.

11. Exercise equipment according to any preceding claim, wherein the metal bars are provided with a soft resilient covering material.

12. Exercise equipment according to any preceding claim, wherein the weight plates are arranged to be releasably secured to the ends of the metal bars by means of bolts.

13. Exercise equipment according to any preceding claim, wherein the holes in the said other strap portion of each hand protective piece are reinforced by metal washers.

- 5 14. Exercise equipment substantially as described herein with reference to the drawings.

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